WHAT IS CLAIMED IS:

1. A method for obtaining a motion vector between two frames of video image data, comprising the steps of:

(a) selecting a two-dimensional current block of a first frame, the current block comprising an N x M array of pixel information, where N and M are positive integers greater than 1;

(b) determining a two-dimensional search area of a second frame based on the current block and a predetermined search range;

(c) determining a first set of candidate blocks by selecting at least one candidate block in each strip of pixel information based on the current block and a predetermined difference criterion, each candidate block comprising an N x M array of pixel information;

(d) determining a second set of candidate blocks by selecting at least one candidate block in each of at least one secondary search areas based on the current block and the predetermined difference criterion, each candidate block comprising an N x M array of pixel information and each of the at least one secondary search areas based on the first set of candidate blocks;

(e) obtaining a reference block from the second set of candidate blocks based on the predetermined difference criterion; and

(f) determining a motion vector representing the distance between the current block and the reference block.

2. The method of claim 1, wherein the step of determining a first set of candidate blocks comprises the steps of:

determining at least one candidate block for each strip, a candidate block comprising the N x M array of pixel information beginning with the pixel elements forming one edge of the strip;

calculating a difference between the current block and the at least one candidate block; and

determining a candidate block for each strip that has minimum difference from the current block.

3. The method of claim 1, wherein the step of determining a second set of candidate blocks comprises the steps of:

determining at least one secondary search area, each secondary search area based on one of the first set of candidate blocks and a predetermined offset value;

selecting at least one reference block within the at least one secondary search area, a reference block comprising an N x M array of pixel information;

determining a difference between the current block and the at least one reference block; and

determining a candidate block for each of the at least one secondary search areas that has minimum difference from the current block.

4. The method of claim 3, wherein the predetermined offset value is based on the predetermined search range.

5. The method of claim 1, wherein the step of obtaining a reference block comprises the step of determining the representative block in the second set of candidate blocks that has the minimum difference from the current block.

6. The method of claim 1, further comprising the step of:

(g) obtaining an integral projection array representing the current block.

7. The method of claim 6, wherein the step of determining a first set of candidate blocks comprises the steps of:

determining at least one reference block for each strip, a reference block formed by the N x M array of pixel information beginning with the pixel elements forming one edge of the strip;

obtaining at least one integral projection array, each array representing one of the at least one reference blocks;

determining a difference between the current block and the at least one reference block in the strip based on the integral projection array representing the current block and the at least one integral projection array representing the reference block; and

determining a candidate block for each strip that has minimum difference from the current block.

8. The method of claim 6, where in the step of determining a second set of candidate blocks comprises the steps of:

determining at least one secondary search area, each secondary search area based on one of the first set of candidate blocks and a predetermined offset value;

determining at least one reference block within the at least one secondary search areas, a reference block comprising an N x M array of pixel information;

obtaining at least one integral projection array, each array representing one of the at least one reference blocks;

determining a difference between the current block and the at least one reference block based on the integral projection array representing the current block and the at least one integral projection array representing the at least one reference block; and

determining a candidate block for each of the at least one secondary search areas that has minimum difference from the current block.

9. The method of claim 8, wherein the predetermined offset value is based on the predetermined search range.

10. The method of claim 6, wherein the step of obtaining a representative block comprises the step of determining the at least one representative block in the second set of candidate blocks that has the minimum difference from the current block.

11. The method of claim 7, wherein the step of obtaining an integral projection array representing a reference block comprises the steps of:

(a) obtaining a first integral projection array representing a first block located a first distance away from the reference block;

(b) obtaining a second integral projection array representing a second block located to a second distance away from the reference block; and

(c) obtaining an integral projection array representing the reference block based on the first and second integral projection arrays and the first and second distances.

12. The method of claim 8, wherein the step of obtaining at least one integral projection array representing the at least one reference block comprises the steps of:

(a) obtaining a first integral projection array representing a first block located a first distance away from the reference block;

(b) obtaining a second integral projection array representing a second block located to a second distance away from the reference block;

(c) obtaining a third integral projection array representing a third block located a third distance away from the reference block;

(d) obtaining a fourth integral projection array representing a fourth block located to a fourth distance away from the reference block; and

(e) obtaining an integral projection array representing the reference block based on the first, second, third, and fourth integral projection arrays and the first, second, third, and fourth distances.

13. A motion estimation system for obtaining a motion vector between two frames of video image data comprising:

(a) means for selecting a two-dimensional current block of a first frame, the current block comprising an N x M array of pixel information, where N and M are positive integers greater than 1;

(b) means for determining a two-dimensional search area of a second frame based on the current block and a predetermined search range;

(c) means for determining a first set of candidate blocks by selecting at least one candidate block in each strip of pixel information based on the current block and a predetermined difference criterion, each candidate block comprising an N x M array of pixel information;

(d) means for determining a second set of candidate blocks by selecting a candidate block in each of at least one secondary search areas based on the current block and the predetermined difference criterion, each candidate block comprising an N x M array of pixel information and the at least one secondary search areas based on the first set of candidate blocks;

(e) means for obtaining a reference block from the second set of candidate blocks based on the predetermined difference criterion; and

(f) means for determining a motion vector representing the distance between the current block and the reference block.

14. The system of claim 13, wherein the means for determining a first set of candidate blocks further comprises:

means for determining at least one candidate block for each strip, a candidate block comprising the N x M array of pixel information beginning with the pixel elements forming one edge of the strip;

means for determining a difference between the current block and the at least one reference blocks in the strip; and

means for determining a candidate block for each strip that has minimum difference from the current block.

15. The system of claim 13, wherein the means for determining a second set of candidate blocks further comprises:

means for determining at least one secondary search area, based on one of the first set of candidate blocks and a predetermined offset value;

means for selecting at least one reference blocks within the at least one secondary search area, a reference block comprising an N x M array of pixel information;

means for determining a difference between the current block and the at least one reference block; and

means for determining a candidate block for each of the at least one secondary search area that has minimum difference from the current block.

16. The system of claim 15, wherein the predetermined offset value is based on the predetermined search range.

17. The system of claim 16, wherein the means for obtaining a reference block further comprises a means for determining a reference block in the second set of candidate blocks that has the minimum difference from the current block.

18. The system of claim 13, further comprising:

(g) means for obtaining an integral projection array representing the current block.

19. The system of claim 18, wherein the means for determining a first set of candidate blocks further comprises:

means for determining at least one reference block for each strip, a reference block formed by the N x M array of pixel information beginning with the pixel elements forming the upper row of the strip;

means for obtaining at least one integral projection array representing the at least one reference block;

means for determining a difference between the current block and the at least one reference block in the strip based on the integral projection array representing the current block and the at least one integral projection array representing the reference block; and

means for determining a candidate block for each strip that has minimum difference from the current block.

20. The system of claim 18, wherein the means for determining a second set of candidate blocks further comprises:

means for determining at least one secondary search area, each secondary search area based on one of the first set of candidate blocks and a predetermined offset value;

means for determining at least one reference block within the at least one secondary search area, a reference block comprising an N x M array of pixel information;

means for obtaining at least one integral projection array representing the at least one reference block;

means for determining a difference between the current block and the at least one reference block based on the integral projection array representing the current block and the at least one integral projection array representing the reference block; and

means for determining a candidate block for each of the at least one secondary search area that has minimum difference from the current block.

21. The system of claim 20, wherein the predetermined offset value is based on the predetermined search range.

22. The system of claim 18, wherein the means for obtaining a reference block comprises means for determining a reference block in the second set of candidate blocks that has the minimum difference from the current block.

23. The system of claim 19, wherein the means for determining a first set of candidate blocks further comprises:

means for obtaining a first integral projection array representing a first block located a first distance away from the reference block;

means for obtaining a second integral projection array representing a second block located to a second distance away from the reference block; and

means for obtaining an integral projection array representing the reference block based on the first and second integral projection arrays and the first and second distances.

24. The system of claim 19, wherein the means for determining a second set of candidate blocks further comprises:

means for obtaining a first integral projection array representing a first block located a first distance away from the reference block;

means for obtaining a second integral projection array representing a second block located to a second distance away from the reference block;

means for obtaining a third integral projection array representing a third block located a third distance away from the reference block;

means for obtaining a fourth integral projection array representing a fourth block located to a fourth distance away from the reference block; and

means for obtaining an integral projection array representing the reference block based on the first, second, third, and fourth integral projection arrays and the first, second, third, and fourth distances.

25. A computer program product comprising:

a computer-usable medium having computer-readable code embodied therein for obtaining a motion vector between two frames of video image data, the computer-usable medium comprising:

a component configured to select a two-dimensional current block of a first frame, the current block comprising an N x M array of pixel information, where N and M are positive integers greater than 1;

a component configured to determine a two-dimensional search area of a second frame based on the current block and a predetermined search range;

a component configured to determine a first set of candidate blocks by selecting at least one candidate block in each strip of pixel information based on the current block and a predetermined difference criterion, each candidate block comprising an N x M array of pixel information;

a component configured to determine a second set of candidate blocks by selecting at least one candidate block in each of at least one secondary search areas based on the current block and the predetermined difference criterion, each candidate block comprising an N x M array of pixel information and each of the at least one secondary search areas based on the first set of candidate blocks;

a component configured to obtain a reference block from the second set of candidate blocks based on the predetermined difference criterion; and

a component configured to determine a motion vector representing the distance between the current block and the reference block.

26. A method of converting a frame of digital video data from a first format to a second format, comprising the steps of:

obtaining digital coefficient information representing pixel information of a first frame in a first format; and

determining a motion vector representing the difference between a first frame in a second format and a second frame in the second format based on the digital coefficient information, wherein the first frame in the second format corresponds to the first frame in the first format.

27. The method of claim 26, wherein the step of determining a motion vector comprises the steps of:

obtaining at least one integral projection array based on the current block using a one-dimensional inverse discrete cosine transform;

obtaining at least one integral projection array based on the first set of candidate blocks using a one-dimensional inverse discrete cosine transform; and

calculating a difference value between the current block and the first set of candidate blocks using the integral projections and a predetermined difference criterion.

28. A system for converting a frame of digital video data from a first format to a second format comprising:

means for obtaining digital coefficient information representing pixel information of a first frame in a first format; and

means for determining a motion vector representing the difference between a first frame in a second format and a second frame in the second format based on the digital coefficient information, wherein the first frame in the second format corresponds to the first frame in the first format.

29. The system of claim 28, wherein the means for determining a motion vector comprises:

means for obtaining at least one integral projection array based on the current block using a one-dimensional inverse discrete cosine transform;

means for obtaining at least one integral projection array based on the first set of candidate blocks using a one-dimensional inverse discrete cosine transform; and

means for calculating a difference value between the current block and the first set of candidate blocks using the integral projections and a predetermined difference criterion.